

What is Claimed is:

1. An aqueous coating formulation which forms a thermal transfer layer of a thermal transfer medium, said thermal transfer layer having a softening point below 200°C, said coating formulation comprising:

an aqueous emulsion of at least one thermoplastic resin and/or wax and at least one epoxy curing agent which initiates crosslinking with an epoxy resin, coemulsified with said at least one thermoplastic resin and/or wax,

wherein said aqueous emulsion comprises an aqueous liquid which does not solubilize the epoxy curing agents, thermoplastic resins or waxes, and

wherein the epoxy curing agents, thermoplastic resins and waxes are each solid at 20°C and have a softening point below 200°C, the thermoplastic resins and waxes are solid at 20°C and the epoxy curing agent is either solid at 20°C or encapsulated in a wax or thermoplastic resin which is solid at 20°C.

2. A coating formulation as in claim 1, which additionally comprises an aqueous dispersion of at least one epoxy resin which is solid at 20°C and has a softening point below 200°C so as to melt mix with the epoxy curing agent at a temperature in the range of 50°C to 250°C.

3. An aqueous coating formulation which forms a thermal transfer layer of a thermal transfer medium, said thermal transfer layer having a softening point below 200°C, said coating formulation comprising a combination of:

a) an aqueous emulsion of at least one thermoplastic resin and/or wax coemulsified with at least one epoxy curing agent which initiates crosslinking with an epoxy resin and

b) an aqueous dispersion of at least one epoxy resin,

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said aqueous coating formulation comprising an aqueous liquid which does not solubilize epoxy curing agents, thermoplastic resins, waxes or the epoxy resins,

wherein each of the epoxy resins, epoxy curing agents, thermoplastic resins and waxes have a softening point below 200°C so as to melt mix at a temperature in the range of 50°C to 250°C, wherein each of the epoxy resins, thermoplastic resins and waxes are solid at 20°C and each of the epoxy curing agents are either solid at 20°C or encapsulated in a thermoplastic resin or wax which is solid at 20°C.

4. An aqueous coating formulation as in claim 1 which additionally comprises a sensible material dispersed therein.

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Q17 5. An aqueous coating formulation as in claim 3 which additionally comprises a sensible material dispersible therein.

6. A coating formulation as in claim 3, which comprises from 5-50 wt% solids, of which, 5 to 15 wt% comprises thermoplastic resin and/or wax, 5 to 25 wt% comprises epoxy curing agent and 30-65 wt% comprises epoxy resin.

7. A coating formulation as in claim 1, which comprises from 5-50 wt% solids, of which, 5 to 25 wt% comprises thermoplastic resin and/or wax, 5 to 25 wt% comprises epoxy curing agent and 30-65 wt% comprises epoxy resin.

8. A coating formulation as in claim 3, wherein the epoxy resin is diglycidyl ether bisphenol A and the epoxy curing agent is a polyamine.

9. A coating formulation as in claim 3, wherein the epoxy curing agent is activated to initiate crosslinking with an epoxy resin at temperatures in the range of 60°C-100°C.

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10. A coating formulation as in claim 3 wherein the epoxy curing agent remains active at 20°C after activation.

11. A coating formulation as in claim 1, wherein the epoxy curing agent is activated to initiate crosslinking with an epoxy resin at temperatures in the range of 60°C-100°C.

12. A coating formulation as in claim 3 wherein the epoxy curing agent remains active at 20°C after activation.

13. A coating formulation as in claim 3 which comprises more than one epoxy resin.

14. A coating formulation as in claim 1 which comprises more than one epoxy curing agent.

15. A coating formulation as in claim 3 which comprises more than one epoxy curing agent.

16. A coating formulation as in claim 1, wherein the epoxy curing agent is selected from the group consisting of polyamines, polymercaptans, dicydiandiamides, carboxylic acid functionalized polyesters, phenol-formaldehyde resins and amine-formaldehyde resins.

17. A coating formulation as in claim 3, wherein the epoxy curing agent is selected from the group consisting of polyamines, polymercaptans, dicydiandiamides, carboxylic acid functionalized polyesters, phenol-formaldehyde resins and amine-formaldehyde resins.

18. A thermal transfer medium comprising a flexible substrate and a single thermal transfer layer, said thermal transfer layer having a softening point below 200°C obtained from an aqueous coating formulation of claim 3, said single thermal transfer layer comprising:

- a) at least one epoxy resin,
- b) at least one epoxy curing agent which initiates crosslinking with an epoxy resin, and

- c) at least one thermoplastic resin and/or wax,

wherein the epoxy curing agent is dispersed within the at least one thermoplastic resin and/or wax and separated from said epoxy resins so as to not react without melt mixing,

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*61* wherein said epoxy resins, epoxy curing agents, thermoplastic resins and waxes each have a softening point below 200°C so as to melt mix at a temperature in the range of 50°C to 250°C, wherein each of the epoxy resins, thermoplastic resins and waxes are solid at 20°C and each of the epoxy curing agents are either solid at 20°C or encapsulated in a thermoplastic resin or wax which is solid at 20°C.

19. A thermal transfer medium comprising a flexible substrate and a thermal transfer layer which has a softening point below 200°C, said thermal transfer layer comprising two layers,

- a) a first layer comprising at least one epoxy resin, and
- b) a second layer obtained from an aqueous coating formulation of claim 1 comprising at least one epoxy curing agent which initiates crosslinking with the epoxy resin, and at least one thermoplastic resin and/or wax, wherein the at least one epoxy curing agent is dispersed within the at least one thermoplastic resin and/or wax and separated from the layer of epoxy resin so as not to react with the epoxy resin without melt mixing, wherein each of the epoxy resins, epoxy curing agents, thermoplastic resins and waxes have a softening point below 200°C so as to melt mix at a temperature in the range of 50°C to

250°C, the thermoplastic resins and waxes are solid at 20°C and the epoxy curing agent is either solid at 20°C or encapsulated in a wax or thermoplastic resin which is solid at 20°C.

20. A thermal transfer medium as in claim 18, wherein the thermal transfer layer has a softening point in the range of 50°C-80°C and additionally comprises a sensible material.

21. A thermal transfer medium as in claim 19, wherein the thermal transfer layer has a softening point in the range of 50°C-80°C and additionally comprises a sensible material in said first layer, said second layer or both.

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a7 22. A thermal transfer medium as in claim 18, wherein the thermal transfer layer comprises from 30-65 weight percent epoxy resin, 5 to 25 weight percent epoxy curing agent, and 5-25 weight percent of at least one thermoplastic resin and/or wax, based on the total weight of solids in the thermal transfer layer.

23. A thermal transfer medium as in claim 19 wherein the second layer of the thermal transfer layer comprises from 5 to 95 wt% epoxy curing agent and from 95 to 5 weight% at least one thermoplastic resin and/or wax.

24. A thermal transfer medium as in claim 18, wherein the epoxy resin is diglycidyl ether bisphenol A and the epoxy curing agent is a polyamine, polymercaptans or dicydiandiamide.

25. A thermal transfer medium as in claim 19, wherein the epoxy resin is diglycidyl ether bisphenol A and the epoxy curing agent is a polyamine, polymercaptans or dicydiandiamide.

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26. A thermal transfer medium as in claim 18, wherein the epoxy curing agent is activated to initiate crosslinking with the epoxy resin at temperatures in the range of 60°C-100°C.

27. A thermal transfer medium as in claim 19, wherein the epoxy curing agent is activated to initiate crosslinking with the epoxy resin at temperatures in the range of 60°C-100°C.

28. A thermal transfer medium as in claim 26, wherein the epoxy curing agent is active at 20°C once activated.

29. A thermal transfer medium as in claim 27, wherein the epoxy curing agent is active at 20°C once activated.

30. A thermal transfer medium as in claim 18, wherein the thermal transfer layer comprises more than one epoxy curing agent.

31. A thermal transfer medium as in claim 19, wherein the thermal transfer layer comprises more than one epoxy curing agent.

32. A thermal transfer medium as in claim 18 which additionally comprises a crosslinking accelerator within the thermal transfer medium which has a softening point below 200°C, and accelerates the crosslinking reaction between the epoxy resin and epoxy curing agent at temperatures in the range of from 50°C to 250°C.

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33. A thermal transfer medium as in claim 18, wherein the epoxy curing agent is selected from the group consisting of polyamines, polymercaptans, dicydiandiamides, carboxylic acid functionalized polyesters, phenol-formaldehyde resins and amine-formaldehyde resins.

34. A thermal transfer medium as in claim 19, wherein the epoxy curing agent is selected from the group consisting of polyamines, polymercaptans, dicydiandiamides, carboxylic acid functionalized polyesters, phenol-formaldehyde resins and amine-formaldehyde resins.

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a' 35. Printed matter produced from a thermal transfer printer and a thermal transfer medium as in claim 18.

36. Printed matter produced from a thermal transfer printer and a thermal transfer medium as in claim 19.

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